Upper Columbia Steelhead ESU

Artificial Propagation Review

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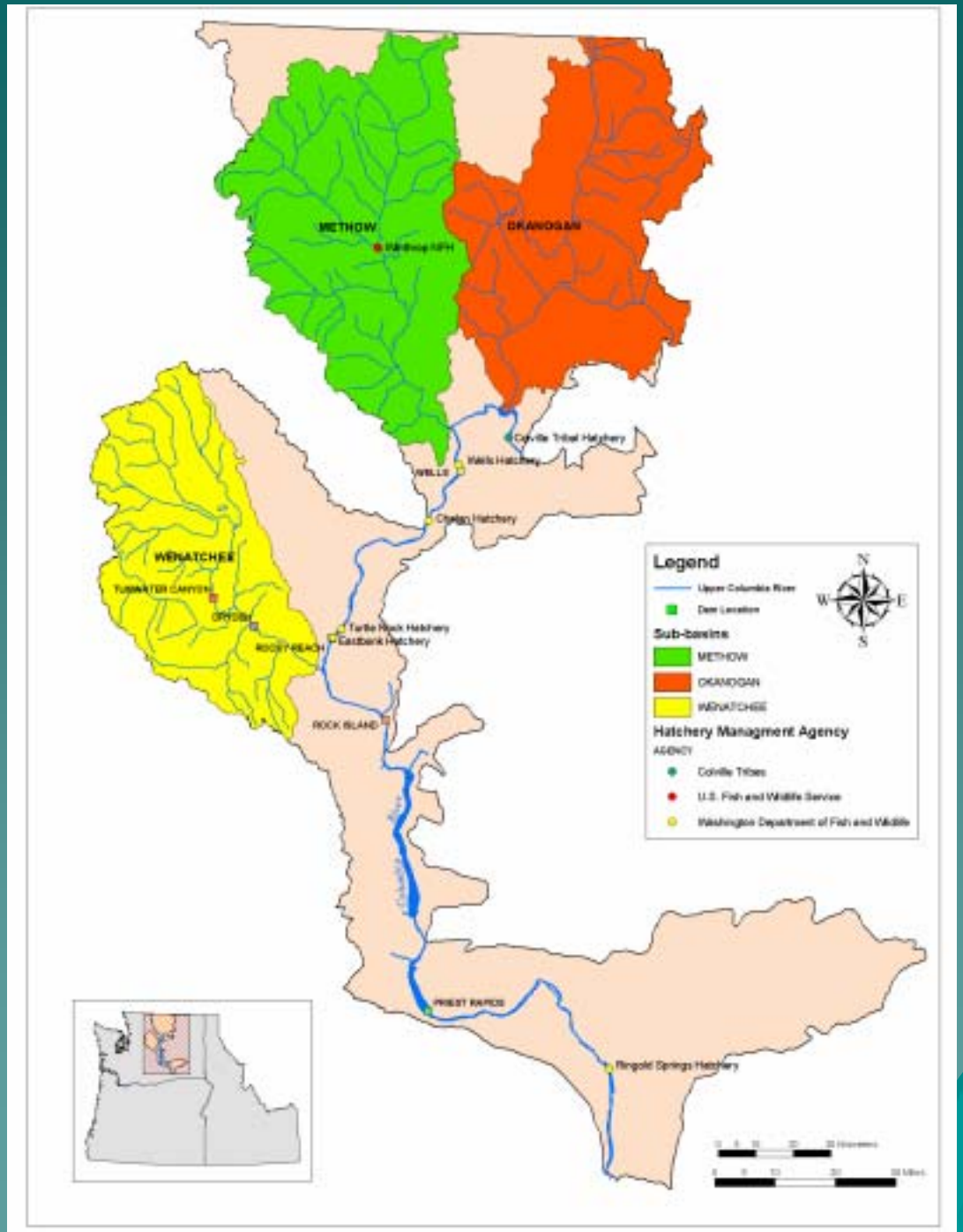

METHOW
OKANOGAN
WENATCHEE
Legend
Upper Columbia River
Dam Location
Sub-basins
METHOW
OKANOGAN
WENATCHEE
Hatchery Management Agency
AGENCY
Colville Tribes
U.S. Fish and Wildlife Service
Washington Department of Fish and Wildlife
N
W
E
S
Colville Tribal Hatchery
Wells Hatchery
Chelan Hatchery
Turtle Rock Hatchery
Eastbank Hatchery
ROCK ISLAND
PRIEST RAPIDS
Ringold Springs Hatchery

Included in the ESU

- Integrated Programs
- Conservation & Harvest Mitigation
  - Wenatchee Basin
    - Wenatchee River stock ≈ 400K smolts
  - Methow Basin
    - Winthrop NFH (Wells stock) ≈ 100K smolts
    - WDFW (Wells stock) ≈ 250K smolts
  - Okanogan Basin
    - WDFW (Wells stock) ≈ 150K smolts
    - Colville Tribes ≈ 40K smolts

Included in the ESU (continued)

- Other Programs
- Harvest Mitigation
  - Mainstem Columbia River
    - Ringold Hatchery (Wells stock) ≈ 180K smolts

ESA Authorization

UCR steelhead artificial propagation programs are authorized under ESA Section 10 Permits 1396, 1396, and 1412 which require:

"the taking will not appreciably reduce the likelihood of the survival and recover of the species in the wild" (ESA Section 10(a)(B)(iv)

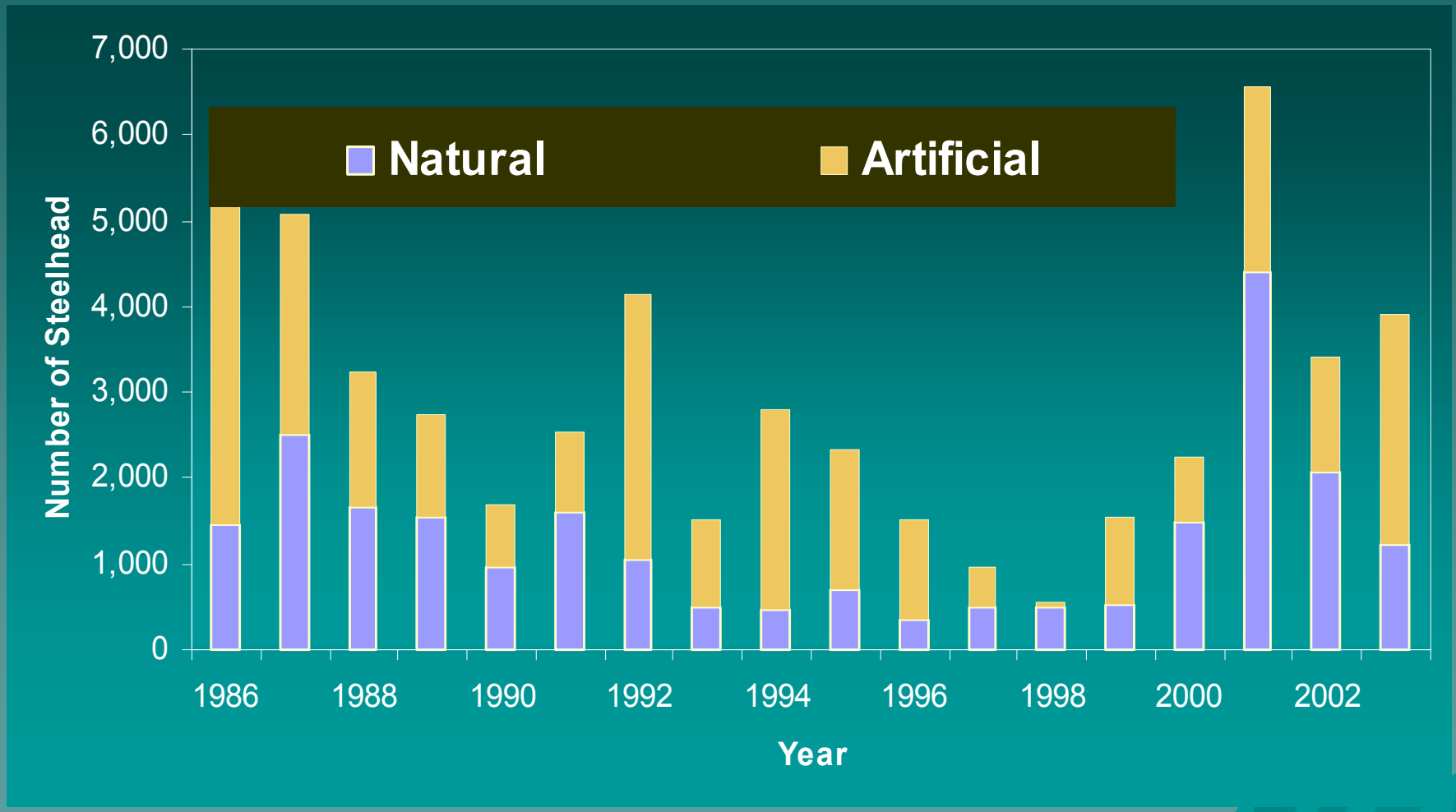
“The effects of hatchery fish on the likelihood of extinction of an ESU, depend on how hatchery fish affect four key attributes”

Abundance

- Wenatchee Basin (1996-2003)
  - 1,220 natural steelhead adults
  - 1,525 hatchery steelhead adults
  - Average of 43% hatchery origin
- Above Wells Dam (1986–2003)
  - 455 natural steelhead adults
  - 5,970 hatchery steelhead adults
  - Average of 92% hatchery origin

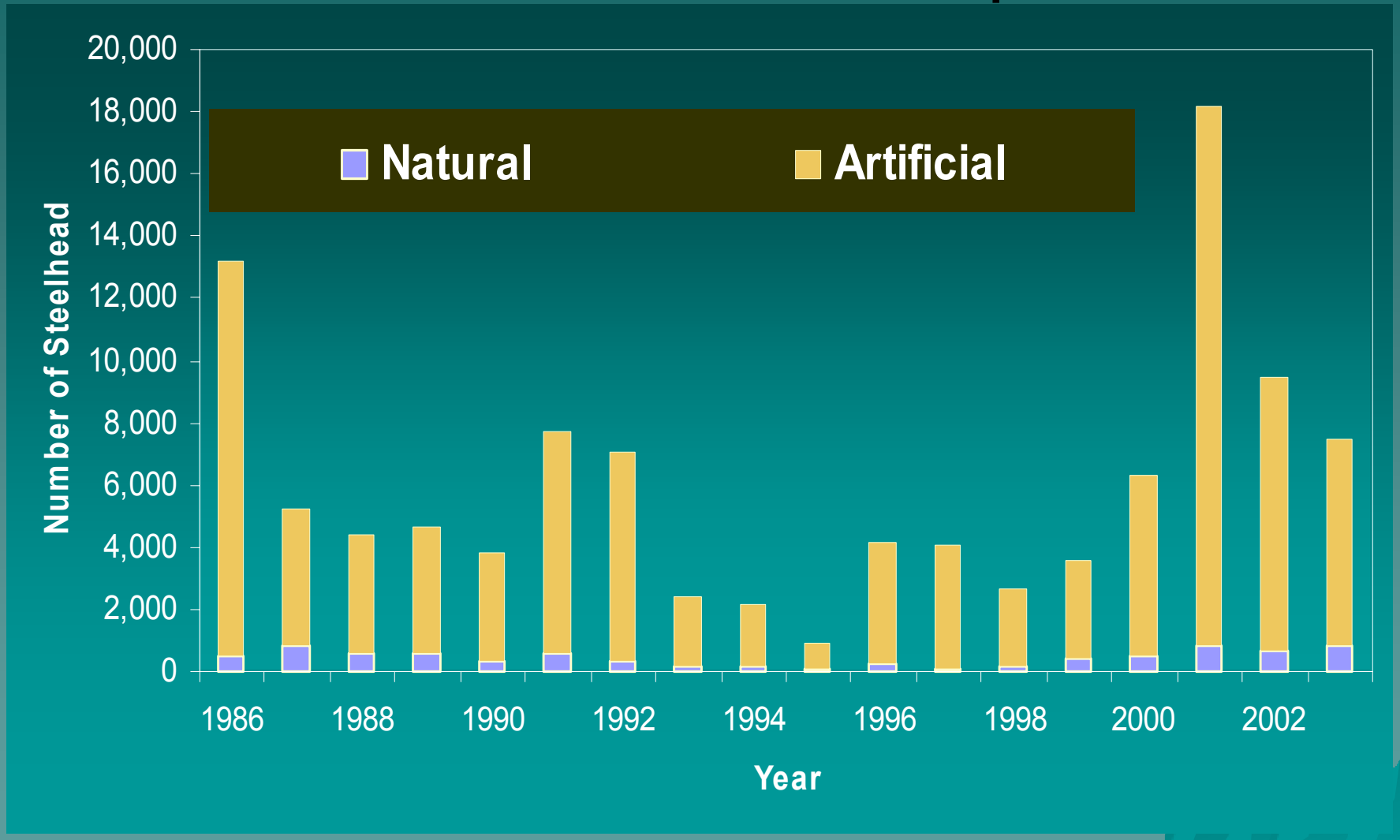
Overall, the programs are <u>increasing</u> the abundance of steelhead in the ESU

Wenatchee Basin Escapement



Dam count data

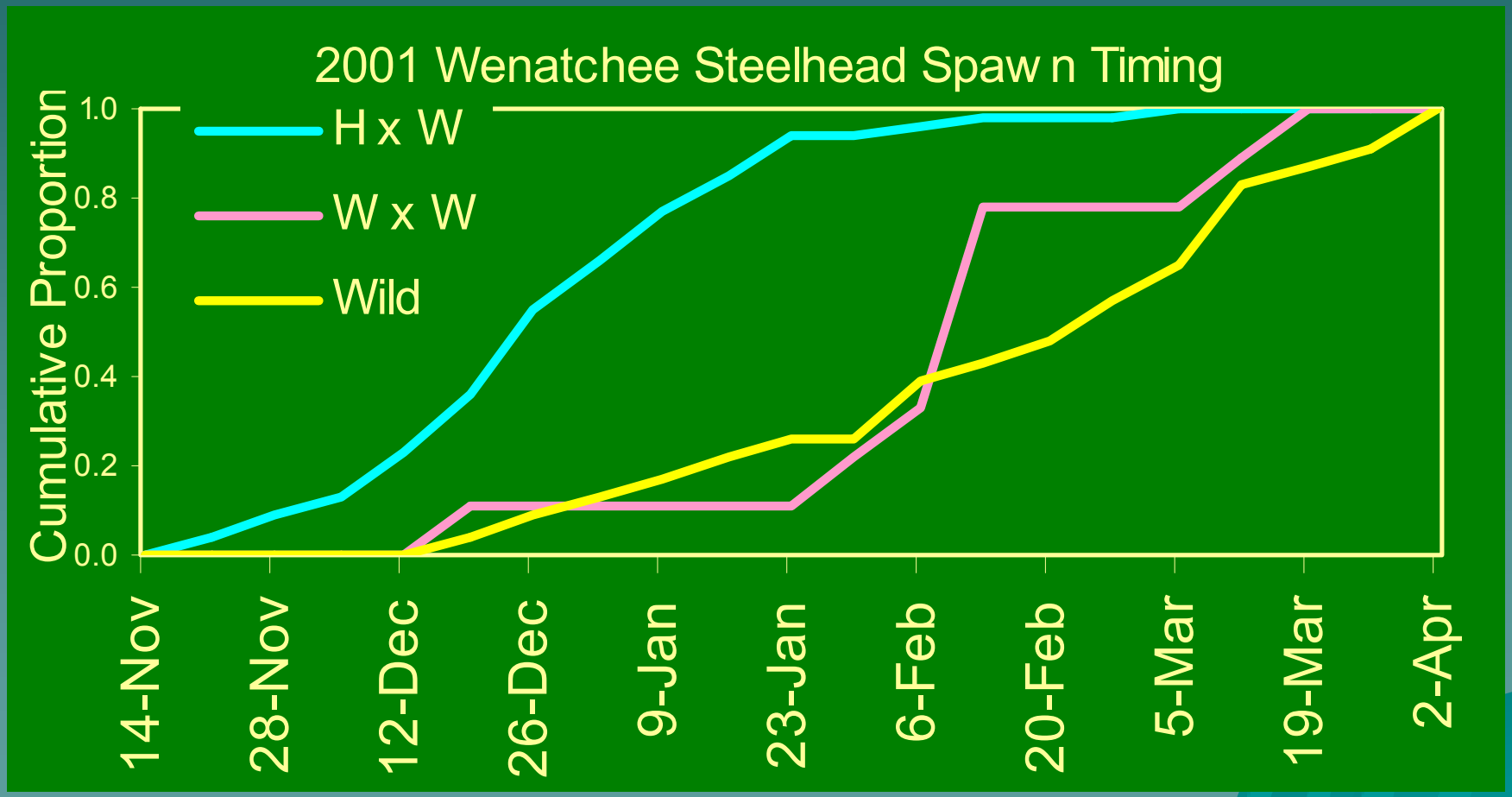
Above Wells Dam Escapement



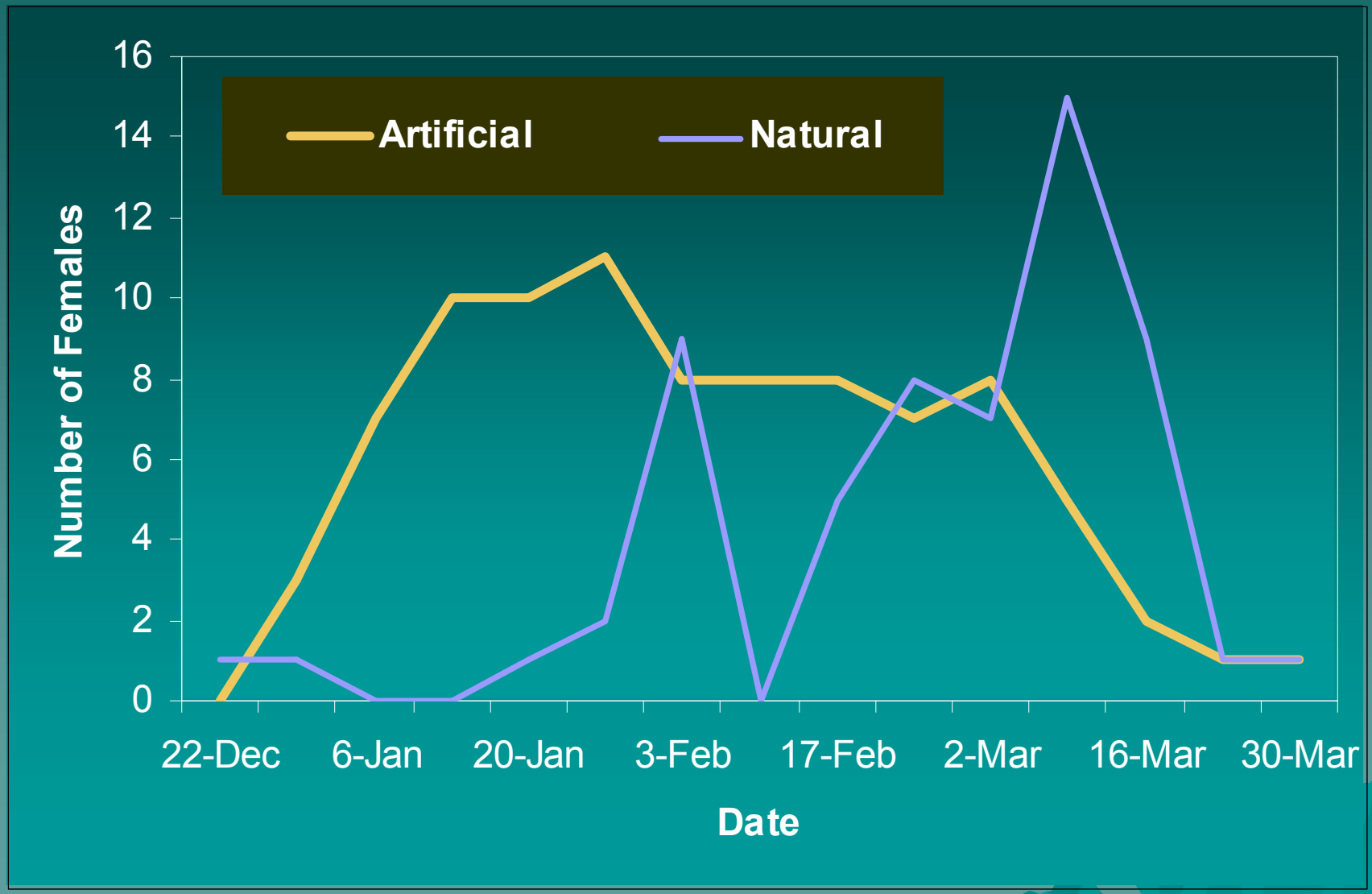
Dam count data

Productivity

- Methow basin natural-origin steelhead are likely only one generation removed from the hatchery because, on average about 90% of spawners are hatchery origin and it is uncertain what effect this has on productivity
- Hatchery origin steelhead in excess of available spawning habitat and broodstock needs may decrease productivity


2001 Wenatchee Steelhead Spaw n Timing
Cumulative Proportion
1.0
0.8
0.6
0.4
0.2
0.0
H x W
W x W
Wild
14-Nov
28-Nov
12-Dec
26-Dec
9-Jan
23-Jan
6-Feb
20-Feb
5-Mar
19-Mar
2-Apr

Wells Steelhead Spawn Timing 2004



Spatial Structure

- Radio tag studies indicate program steelhead stray from release areas
- Studies are examining the effects of release site and/or acclimation periods on the distribution of returning adults
- Program steelhead have been found spawning in small tributaries
- Overall, the effect is neutral

Diversity

- Recent (1996) separation of Wenatchee basin programs from the Wells program is expected to increase diversity over time
- High proportion of steelhead on spawning grounds from the Wells program likely decreases local adaptation of the Methow basin and Okanogan basin populations
- The small Omak Creek program should increase diversity over time

Effect by Program

Viability Criteria	Population		
	Wenatchee	Methow	Okanogan
Abundance	↑	↑	↑
Productivity	↔	↔	↔
Spatial Structure	↑	↔	↔
Diversity	↑	↓	↓

Effects of Artificial Propagation on VSP Attributes

Viability Criteria	BRT VSP Risk Score	Decreases Risk	Neutral or Uncertain	Increases Risk
Abundance	3.5	√		
Productivity	4.3		√ ?	√ ?
Spatial Structure	3.1	√		
Diversity	3.6		√	

	Endangered	Threatened	Not Warranted
BRT Findings:	54%	44%	2%
Recommendation:	Change to Threatened		